

REMARKS

Claims 1-3, and 5-17 are rejected. Claims 18-27 are withdrawn from consideration. Claim 4 is objected to. Claim 1 has been amended. Claim 2 has been canceled. New claim 28 has been added. Claims 1, 3, 5-17 and 28 are presently pending in the application. Favorable reconsideration of the application in view of the following remarks is respectfully requested.

The basis for the amendment of claim 1 is claim 2 as originally filed and the specification as originally filed, page 3, line 28.

Allowable Subject Matter:

The Applicants thank the Examiner for indicating that claim 4, objected to as being dependent upon a rejected base claim, would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, as neither Burns nor Kobayashi teach or even fairly suggest a latex polymer as recited in claim 4. Claim 4 has been rewritten and is included as new claim 28.

Rejection Under 35 U.S.C. §103(a):

The Examiner has rejected claims 1-3 and 9-17 under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al. (US 6,214,458 B1) in view of Poerschke et al. (DE 197 21 238 A1) as evidenced by Aono et al. (US 4,946,741), Burns et al. (US 6,089,704), and Peternel et al. (US 6,420,016 B1), indicating that Kobayashi discloses an image recording sheet for ink jet printing comprising a support film, an image receiving layer provided on one side of the support, with a subbing layer equivalent to the claimed hydrophilic absorbing layer containing gelatin provided between the support film and the image receiving layer, equivalent to the claimed hydrophilic overcoat polymer layer, containing a water soluble resin, exemplified by methyl cellulose, and inorganic particles and/or organic particles, but fails to disclose the use of modified gelatin in the subbing layer as claimed. The examiner also indicates that Poerschke discloses an ink jet recording medium comprising an ink receiving layer containing gelatin modified with alkylene succinic acid, and therefore, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the modified gelatin of Poerschke with the subbing layer of Kobayashi in order to reduce tackiness of coating, to reduce drying time, to reduce bleeding and to provide an easy, reproducible, and low-cost production. The Examiner also states that, while

Kobayashi does not disclose the components of the polymer latex, Burns teaches an ink jet recording element comprising a support, a hydrophilic image recording layer (equivalent to the claimed hydrophilic absorbing layer) on the support, and an overcoat layer comprising a vinyl latex polymer (equivalent to the claimed hydrophilic overcoat polymer layer) on the hydrophilic image recording layer and, therefore, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the polymer latex of Burns with the invention of Kobayashi so as to provide an ink jet recording element which has a high gloss and fast drying time without having a high viscosity.

Kobayashi discloses an image recording sheet which has a high glossiness and forms on its surface an image of a high quality, especially from the viewpoint of a high glossiness and a good graininess. The image recording sheet is composed of a transparent support film, a transparent image-receiving layer provided on one surface of the support film, and a white coated layer provided on the other surface of the support film. Kobayashi fails to disclose the use of succinylated gelatin in combination with a hydrophilic overcoat polymer layer comprising hydroxypropylmethyl cellulose and methyl cellulose ethers and vinyl latex. Kobayashi also fails to mention improved laminate adhesion resulting from use of succinylated gelatin in combination with a hydrophilic overcoat polymer layer comprising hydroxypropylmethyl cellulose and methyl cellulose ethers and vinyl latex.

Poerschke discloses a succinylated gelatin for use in inkjet paper to produce a gelatin with improved miscibility with polymeric components found in inkjet coatings and which can maintain the desired properties of high gloss, color fastness, freedom from cracking, short dry time, absence of tackiness, low spotty appearance and which is easy, reproducible and low-cost to manufacture. Poerschke fails to disclose the use of succinylated gelatin in combination with a hydrophilic overcoat polymer layer comprising hydroxypropylmethyl cellulose and methyl cellulose ethers and vinyl latex. Poerschke also fails to mention improved laminate adhesion resulting from use of succinylated gelatin in combination with a hydrophilic overcoat polymer layer comprising hydroxypropylmethyl cellulose and methyl cellulose ethers and vinyl latex.

Aono discloses an ink recording sheet comprising a transparent support having thereon an ink recording layer comprising a mixture of an amino

group-deactivated gelatin derivative and a polyalkylene oxide to provide evenness of image density of uniformly drawn portions, absorptivity of ink just after drawing, and curling characteristics, and high optical density and excellent photo transmissibility. Aono fails to disclose the use of succinylated gelatin in combination with a hydrophilic overcoat polymer layer comprising hydroxypropylmethyl cellulose and methyl cellulose ethers and vinyl latex. Aono also fails to mention improved laminate adhesion resulting from use of succinylated gelatin in combination with a hydrophilic overcoat polymer layer comprising hydroxypropylmethyl cellulose and methyl cellulose ethers and vinyl latex.

Burns discloses an ink jet recording element comprising a support, a hydrophilic image-recording layer, and an overcoat layer comprising a vinyl latex polymer having the formula:



wherein: A is a hydrophilic, vinyl monomer; B is a hydrophobic, vinyl monomer; C is a cationic monomer; x is from about 1 to about 80 mole %; y is from about 10 to about 80 mole %; and z is from about 2 to about 20 mole %. The inkjet image recording element of Burns yields printed images with high optical densities, excellent image quality, higher gloss, and fast drying. Burns fails to disclose the use of succinylated gelatin in combination with a hydrophilic overcoat polymer layer comprising hydroxypropylmethyl cellulose and methyl cellulose ethers and vinyl latex. Burns also fails to mention improved laminate adhesion resulting from use of succinylated gelatin in combination with a hydrophilic overcoat polymer layer comprising hydroxypropylmethyl cellulose and methyl cellulose ethers and vinyl latex.

Peternell discloses a recording sheet for ink jet printing comprising a support having at least one ink receiving layer and a gelatin containing absorption layer, characterized in that the absorption layer is situated between the support and the ink receiving layer and that it comprises a micelle forming compound. The invention of Peternell relates to transmissive or reflective recording sheets of at least two layers, suitable for use in an ink jet printing process, where inks consisting of at least one dye and an ink liquid are used, and to coating compositions for the preparation of ink receiving layers for this process. Peternell fails to disclose the use of succinylated gelatin in combination

with a hydrophilic overcoat polymer layer comprising hydroxypropylmethyl cellulose and methyl cellulose ethers and vinyl latex. Peternell also fails to mention improved laminate adhesion resulting from use of succinylated gelatin in combination with a hydrophilic overcoat polymer layer comprising hydroxypropylmethyl cellulose and methyl cellulose ethers and vinyl latex.

The present invention, as amended, relates to a support having thereon a hydrophilic absorbing layer of succinylated gelatin and an adhesion promoting hydrophilic overcoat polymer layer comprising hydroxypropylmethyl cellulose and methyl cellulose ether and vinyl latex polymer which produces an ink recording element having improved laminate adhesion while maintaining improved image quality, and less differential gloss.

To establish a prima facie case of obviousness requires, first, there must be some suggestion or motivation, either in the reference itself, or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in the applicant's disclosure.

The references to Kobayashi, Poerschke, Aono, Burns and Peternell fail to teach, disclose or suggest succinylated gelatin or succinylated gelatin in combination with a hydrophilic overcoat polymer layer comprising hydroxypropylmethyl cellulose and methyl cellulose ether and vinyl latex polymer. The references also fails to teach disclose or suggest the use of a hydrophilic absorbing layer of succinylated gelatin and a hydrophilic overcoat polymer layer comprising hydroxypropylmethyl cellulose and methyl cellulose ether and vinyl latex polymer to improve laminate adhesion. As a result, no combination of the reference discloses all of the present claims limitations.

None of the references discloses, teaches or suggests that succinylated gelatin or succinylated gelatin in combination with an adhesion promoting hydrophilic overcoat polymer layer comprising hydroxypropylmethyl cellulose and methyl cellulose ether and vinyl latex polymer produces. There are a very large number of compounds and methods known to those skilled in the art which may be utilized in ink recording elements. There are, further, a tremendous

number of types of gelatin and hydrophilic polymers. Photographic systems are very complex and unpredictable and the fact that two technologies are independently useful does not indicate that the combination will be useful or beneficial. In addition, none of the references teaches increased adhesion resulting from the combination of particular types of gelatins and hydrophilic polymers. At most, the Examiner has set forth an argument that it would be "obvious to try" the combination of the cited references. Therefore, there is no reasonable expectation of success found in any combination of the cited references.

Kobayashi discloses an image recording sheet composed of a transparent support film, a transparent image-receiving layer provided on one surface of the support film, and a white coated layer provided on the other surface of the support film, which has a high glossiness and forms on its surface an image of a high quality, especially from the viewpoint of a high glossiness and a good graininess. Poerscke discloses a succinylated gelatin with improved miscibility with polymeric components found in inkjet coatings and which can maintain the desired properties of high gloss, color fastness, freedom from cracking, short dry time, absence of tackiness, low spotty appearance and which is easy, reproducible and low-cost to manufacture. Aono discloses an ink recording layer comprising a mixture of an amino group-deactivated gelatin derivative and a polyalkylene oxide to provide evenness of image density of uniformly drawn portions, absorptivity of ink just after drawing, and curling characteristics, and high optical density and excellent photo transmissibility. Burns discloses an ink jet recording element comprising a support, a hydrophilic image- recording layer, and an overcoat layer comprising a vinyl latex polymer, which yields an element having printed images with high optical densities, excellent image quality, higher gloss, and fast drying. Peternell discloses a transmissive or reflective recording sheet for ink jet printing comprising a support having at least one ink receiving layer and a gelatin containing absorption layer, characterized in that the absorption layer is situated between the support and the ink receiving layer and that it comprises a micelle forming compound. There is no suggestion or motivation in the references to modify the reference or to combine reference teachings to produce an ink recording element containing succinylated gelatin or succinylated gelatin in combination with a hydrophilic overcoat polymer layer comprising

hydroxypropylmethyl cellulose and methyl cellulose ether and vinyl latex polymer which produces an element having surprisingly improved laminate adhesion.

Also, as noted by the Examiner, a prima facie case of obviousness may be rebutted where the results of the optimizing variable, which is known to be result-effective, are unexpectedly good. Such surprising results are contained in Table 2, page 22 of the specification, summarized below. As can be seen from the two columns "Element of the invention present" and "Elements of the invention Missing", the laminate adhesion was surprisingly elevated only when all of the elements of the invention, that is, succinylated gelatin, methyl cellulose and hydroxypropyl cellulose and vinyl latex polymer, were present. Elements containing only methyl cellulose, only vinyl latex polymer and / or only hydroxypropyl cellulose in the overcoat layer did not demonstrate elevated laminate adhesion. The element containing non-succinylated gelatin also failed to show surprisingly improved adhesion.

Table 2

Example	Laminate adhesion	Elements of the invention present	Elements of the invention Missing
Example 1	481	Succinylated gelatin Methyl cellulose Hydroxypropyl cellulose Vinyl latex polymer	None
Control Example 1	227	Succinylated gelatin Hydroxypropyl cellulose Vinyl latex polymer	Methyl cellulose
Control Example 2	345	Succinylated gelatin Methyl cellulose Vinyl latex polymer	Hydroxypropyl cellulose
Control Example 3	359	Succinylated gelatin Hydroxypropyl cellulose Vinyl latex polymer	Methyl cellulose
Control Example 4	121	Succinylated gelatin Methyl cellulose Hydroxypropyl cellulose	Vinyl latex polymer
Control Example 5	166	Succinylated gelatin Methyl cellulose	Hydroxypropyl cellulose Vinyl latex polymer
Control Example 6	80	Succinylated gelatin Hydroxypropyl cellulose	Methyl cellulose Vinyl latex polymer
Control Example 7	46	Succinylated gelatin	Methyl cellulose Hydroxypropyl cellulose Vinyl latex polymer

Control Example 8	54	Hydroxypropyl cellulose	Succinylated gelatin Methyl cellulose Vinyl latex polymer
Control Example 9	254	Succinylated gelatin Vinyl latex polymer	Methyl cellulose Hydroxypropyl cellulose

In summary, the references fail to teach, disclose or suggest the use of succinylated gelatin or succinylated gelatin in combination with an adhesion promoting hydrophilic overcoat polymer layer comprising hydroxypropylmethyl cellulose and methyl cellulose ether and vinyl latex polymer which produces an element having improved laminate adhesion when compared to the elements of the prior art. The references also provide no motivation to combine and no expectation of success beyond an "obvious to try" concept. In addition, there is evidence of unexpected results with the use of succinylated gelatin with respect to laminate adhesion as compared to other types of gelatin and the use of succinylated gelatin in combination with a hydrophilic overcoat polymer layer comprising hydroxypropylmethyl cellulose and methyl cellulose ether and vinyl latex polymer which produces an element having improved laminate adhesion when compared to the elements of the prior art. Therefore, the Applicants believe the rejection should be reconsidered and withdrawn.

Rejection of Claims 1-3 and 5-17 Under 35 U.S.C. §103(a):

The Examiner has rejected claims 1-3 and 5-17 under 35 U.S.C. 103(a) as being unpatentable over Kawano et al. (US 5,478,631) in view of Poerschke et al. (DE. 197 21 238 A1) as evidenced by Aono et al. (US 4,946,741), Burns et al. (US 6,089,704), and Peternell et al. (US 6,420,016 B1), indicating that Kawano discloses an ink jet recording element having a support bearing a top hydrophilic absorbing layer, equivalent to the claimed hydrophilic overcoat polymer layer, and bottom hydrophilic absorbing layer, equivalent to the claimed hydrophilic absorbing layer, both formed from an aqueous composition including one or more water soluble high polymers such as methyl cellulose and gelatin, and further including binders such as polyurethane and vinyl latex, the bottom

layer may be further divided to form an intermediate layer, equivalent to the claimed inner layer, and a lowest layer, and therefore, it would have been obvious to one of ordinary skill in the art use less of the binders than that of the water soluble high polymer, as required component in each layer. The Examiner continues that, although Kawano fails to disclose the use of modified gelatin in the bottom layer as claimed, Poerschke discloses an ink jet recording medium comprising an ink receiving layer containing gelatin modified with alkylene succinic acid, and therefore, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the modified gelatin of Poerschke with the with the bottom layer of Kawano in order to reduce tackyness of coating, to reduce drying time, to reduce bleeding and to provide an easy, reproducible, and low-cost production. The Examiner also states that, while Kawano does not disclose the components of the polymer latex, Burns teaches an ink jet recording element comprising a support, a hydrophilic image recording layer (equivalent to the claimed hydrophilic absorbing layer) on the support, and an overcoat layer comprising a vinyl latex polymer (equivalent to the claimed hydrophilic overcoat polymer layer) on the hydrophilic image recording layer and, therefore, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the polymer latex of Burns with the invention of Kawano so as to provide an ink jet recording element which has a high gloss and fast drying time without having a high viscosity.

Kawano discloses an ink jet recording sheet comprising a substrate and an ink receptive layer disposed on the substrate, the ink receptive layer containing a pigment and a binder as its main components, the improvement comprising the ink receptive layer being an aqueous composition containing a pigment and an amphoteric latex as its main components, which absorbs water-based ink well, gives high-grade images, and ensures excellent water resistance of printed images. Kawano fails to disclose the use of succinylated gelatin in combination with a hydrophilic overcoat polymer layer comprising hydroxypropylmethyl cellulose and methyl cellulose ethers and vinyl latex. Kawano also fails to mention improved laminate adhesion resulting from use of succinylated gelatin in combination with a hydrophilic overcoat polymer layer comprising hydroxypropylmethyl cellulose and methyl cellulose ethers and vinyl latex polymer.

To establish a prima facie case of obviousness requires, first, there must be some suggestion or motivation, either in the reference itself, or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in the applicant's disclosure.

The references to Kawano, Poerschke, Aono, Burns and Peternell fail to teach, disclose or suggest succinylated gelatin or succinylated gelatin in combination with a hydrophilic overcoat polymer layer comprising hydroxypropylmethyl cellulose and methyl cellulose ether and vinyl latex polymer. The references also fails to teach disclose or suggest the use of a hydrophilic absorbing layer of succinylated gelatin and a hydrophilic overcoat polymer layer comprising hydroxypropylmethyl cellulose and methyl cellulose ether and vinyl latex polymer to improve laminate adhesion. As a result, no combination of the reference discloses all of the present claims limitations.

None of the references discloses, teaches or suggests that succinylated gelatin or succinylated gelatin in combination with an adhesion promoting hydrophilic overcoat polymer layer comprising hydroxypropylmethyl cellulose and methyl cellulose ether and vinyl latex polymer produces. There are a very large number of compounds and methods known to those skilled in the art which may be utilized in ink recording elements. There are, further, a tremendous number of types of gelatin and hydrophilic polymers. Photographic systems are very complex and unpredictable and the fact that two technologies are independently useful does not indicate that the combination will be useful or beneficial. In addition, none of the references teaches increased adhesion resulting from the combination of particular types of gelatins and hydrophilic polymers. At most, the Examiner has set forth an argument that it would be "obvious to try" the combination of the cited references. Therefore, there is no reasonable expectation of success found in any combination of the cited references.

Kawano discloses an ink jet recording sheet comprising a substrate and an ink receptive layer, which may be split into additional layers, containing a

pigment and an amphi-ion latex binder as its main components, which absorbs water-base ink well, gives high-grade images, and ensures excellent water resistance of printed images. Poerscke discloses a succinylated gelatin with improved miscibility with polymeric components found in inkjet coatings and which can maintain the desired properties of high gloss, color fastness, freedom from cracking, short dry time, absence of tackiness, low spotty appearance and which is easy, reproducible and low-cost to manufacture. Aono discloses an ink recording layer comprising a mixture of an amino group deactivated gelatin derivative and a polyalkylene oxide to provide evenness of image density of uniformly drawn portions, absorptivity of ink just after drawing, and curling characteristics, and high optical density and excellent photo transmissibility. Burns discloses an ink jet recording element comprising a support, a hydrophilic image-recording layer, and an overcoat layer comprising a vinyl latex polymer, which yields an element having printed images with high optical densities, excellent image quality, higher gloss, and fast drying. Peternell discloses a transmissive or reflective recording sheet for ink jet printing comprising a support having at least one ink receiving layer and a gelatin containing absorption layer, characterized in that the absorption layer is situated between the support and the ink receiving layer and that it comprises a micelle forming compound. There is no suggestion or motivation in the references to modify the reference or to combine reference teachings to produce an ink recording element containing succinylated gelatin or succinylated gelatin in combination with a hydrophilic overcoat polymer layer comprising hydroxypropylmethyl cellulose and methyl cellulose ether and vinyl latex polymer which produces an element having surprisingly improved laminate adhesion.

Also, as noted by the Examiner, a prima facie case of obviousness may be rebutted where the results of the optimizing variable, which is known to be result-effective, are unexpectedly good. Such surprising results are contained in Table 2, page 22 of the specification, as discussed above. As can be seen from the two columns "Element of the invention present" and "Elements of the invention Missing", the laminate adhesion was surprisingly elevated only when all of the elements of the invention, that is, succinylated gelatin, methyl cellulose and hydroxypropyl cellulose and vinyl latex polymer, were present were present. Elements containing only methyl cellulose, only vinyl latex polymer and / or only

hydroxypropyl cellulose in the overcoat layer did not demonstrate elevated laminate adhesion. The element containing non-succinylated gelatin also failed to show surprisingly improved adhesion.

It is believed that the foregoing is a complete response to the Office Action and that the claims are in condition for allowance. Favorable reconsideration and early passage to issue is therefore earnestly solicited.

Respectfully submitted,


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